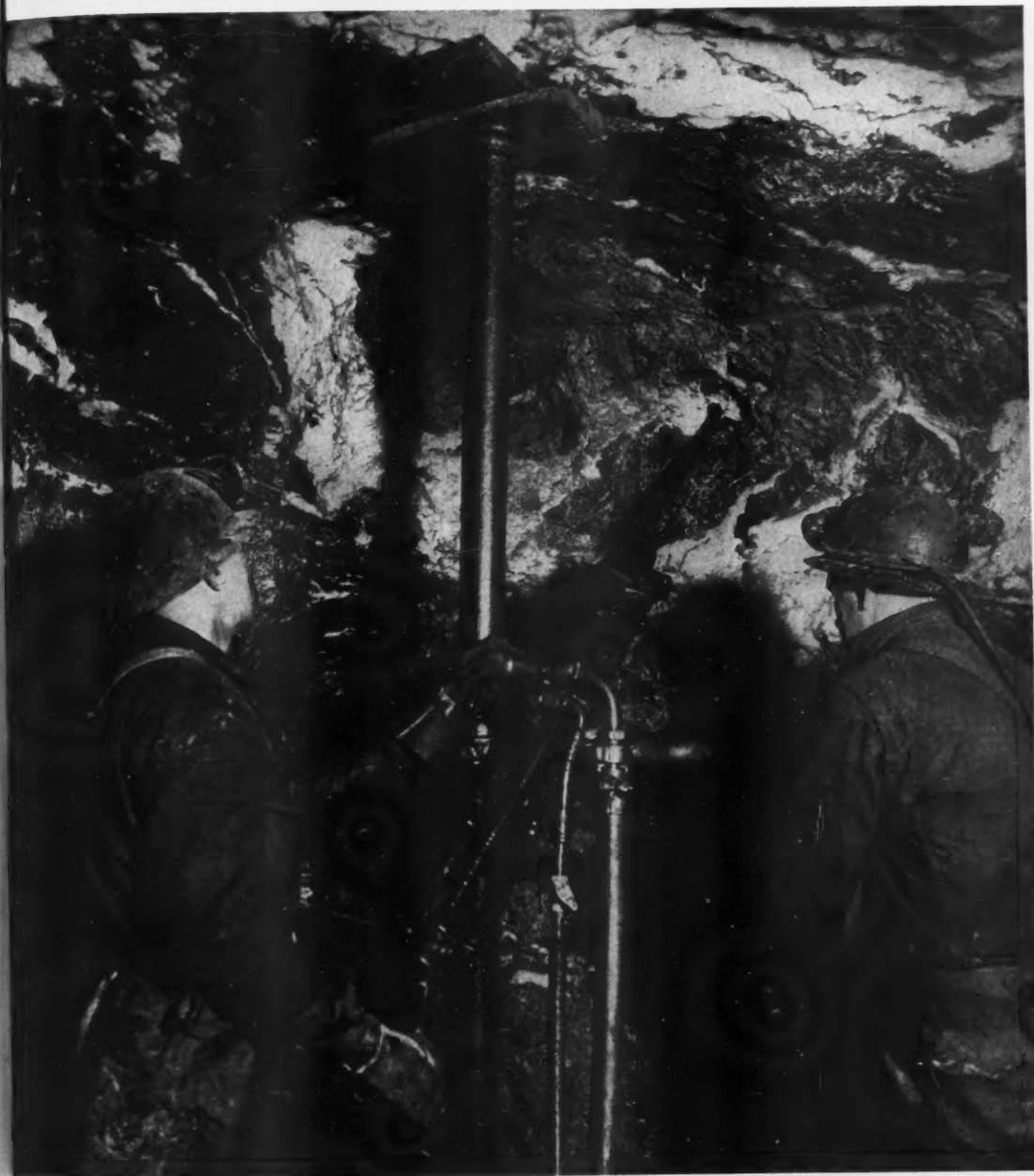


# Compressed Air

OCTOBER 1943

## Magazine



STARTING THE  
DRILL ROUND

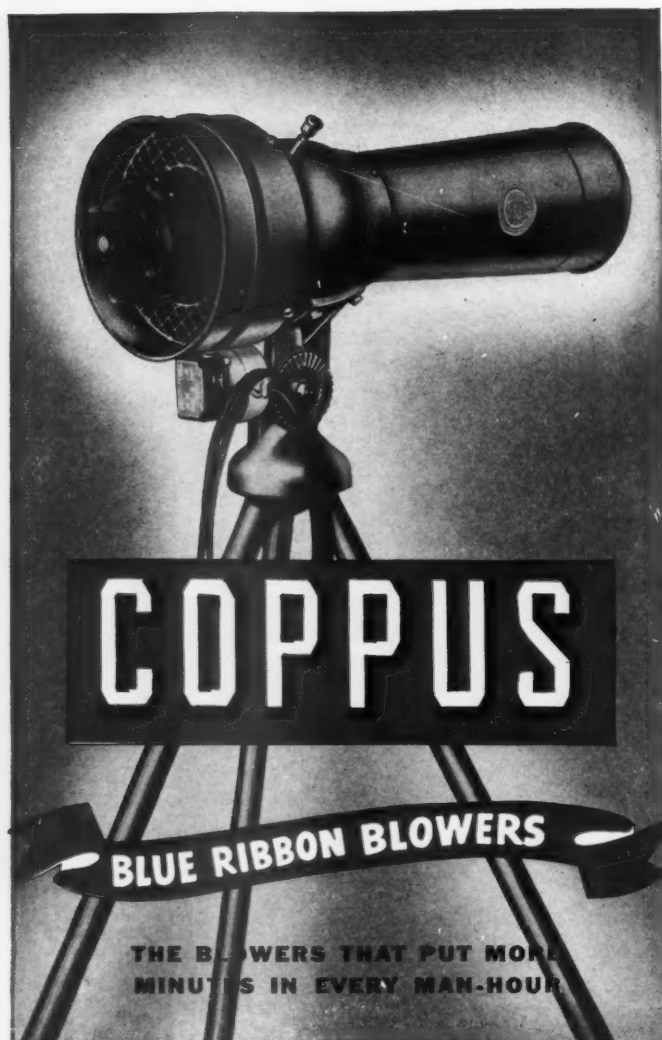
Drifting in a Metal  
Mine

VOLUME 48 • NUMBER 10

NEW YORK • LONDON

# New Strength through Air

**WORKERS HAVE MORE WAR PRODUCTION "DRIVE"  
WITH A COPPUS BLOWER OR HEAT KILLER NEARBY**



Thousands of cases prove that a man can do more work where it's cool and comfortable than where heat and bad air are continually sapping his energy.

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**CABLE MANHOLE AND TANK VENTILATORS — BOILER MANHOLE BLOWERS AND EXHAUSTERS — HEAT KILLERS — SHIPHOLD VENTILATORS . . . DESIGNED FOR YOUR INDUSTRY — ENGINEERED FOR YOU**

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**PLEASE SEND ME INFORMATION ON SUPPLYING FRESH AIR TO MEN WORKING:**

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- ☐ in aeroplane fusilages, wings, etc.
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- ☐ on steam-heated rubber processes.

- ☐ on boiler repair jobs.
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- ☐ wires and sheets.
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- ☐ around cracking stills.

- ☐ exhausting welding fumes.
- ☐ stirring up stagnant air wherever men are working or material is drying.
- ☐ drying of walls, sheets; etc., after treated with coating material.

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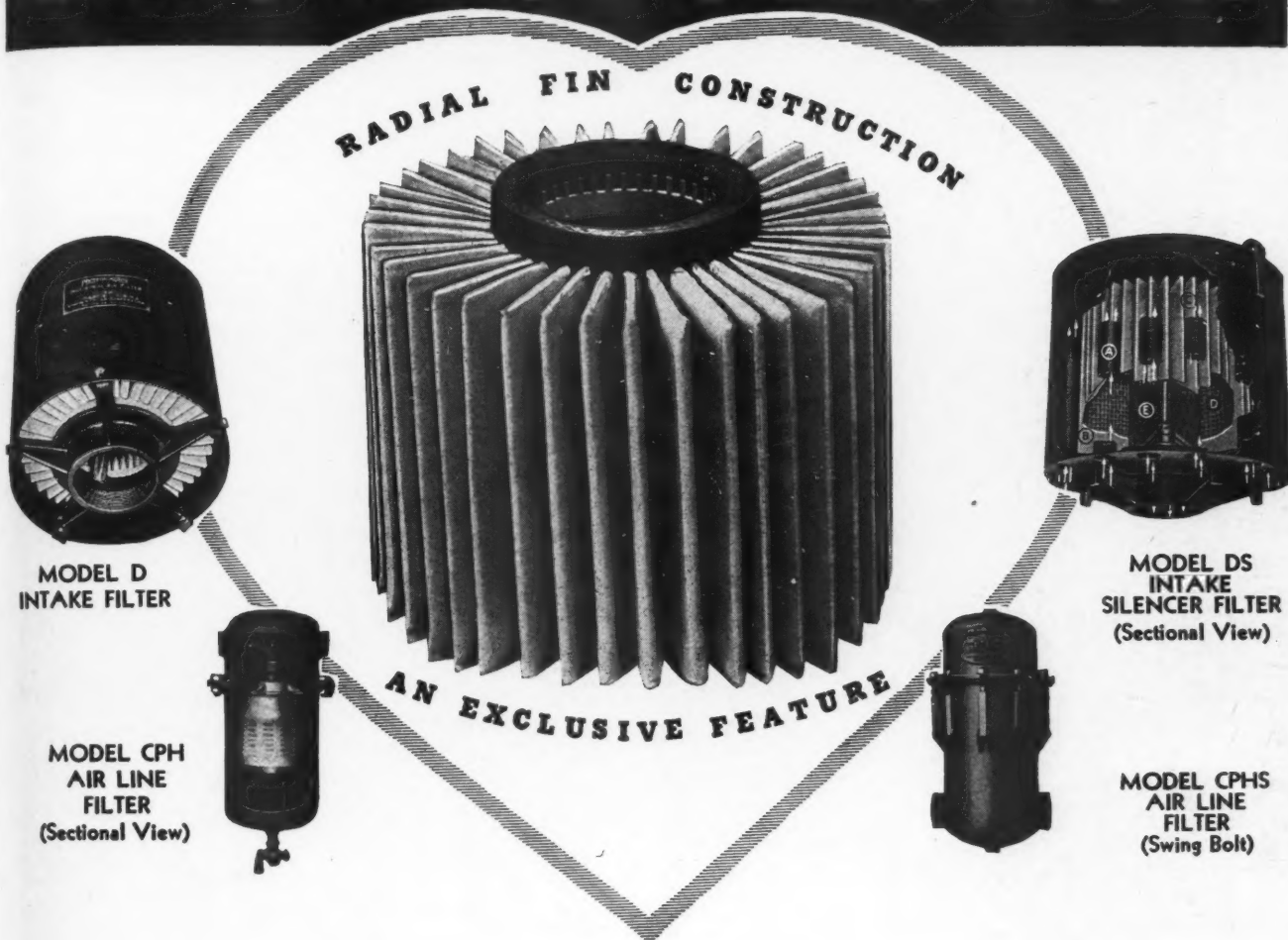
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AIR FILTERS

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Victory begins in the deep earth where nature has locked the much needed war metals, copper, zinc, iron, nickel, tungsten, lead, molybdenum; all these and many others are the elements which make the sinews of Victory. The task of releasing these metals from their underground origin is now being performed at an amazing speed. Huge production of metal ores has made it possible for our Commanders-in-chief and their military staffs to plan for certain Victory. But underground where Victory begins the "Eimco Loader" has been one of the miracles of modern mechanics that has made production records possible. In practically every mine in the United States that produces war metals the Eimco Loader is on a twenty-four hour shift.

A large staff of Eimco Loader field men are available for advice, service and consultation. Join the parade of users!



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# Goblins of the Stratosphere

**L**OOKING like men from Mars, the faces and heads of high-altitude fliers are protected against the rarefied atmosphere ... by masks of plastic supplied with oxygen from high-pressure storage tanks. The production of oxygen for filling these tanks is an interesting wartime use of compressors.

To maintain compressors at top operating efficiency, not only for filling oxygen tanks, but for compressing air in thousands of industrial plants and mines throughout the U. S., operators everywhere are lubricating them with Texaco.

*Texaco Alcaid, Algol and Ursa Oils* assure wide-opening, tight-closing valves,

free piston rings, open ports, clear air lines, maximum service life between inspections and overhauls, fewer repairs and replacements.

So effective have Texaco lubricants proved in increasing output that they are definitely preferred in many important fields, a few of which are listed at the right.

A Texaco Lubrication Engineer will gladly cooperate in the selection of the most suitable lubricants for your equipment. Just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

## THEY PREFER TEXACO

- ★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.
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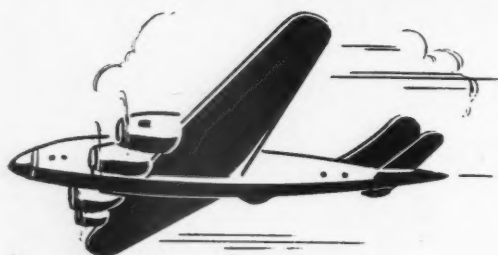
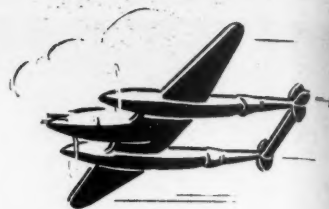
FOR ALL AIR COMPRESSORS AND TOOLS

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT - CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

OCTOBER, 1943

Adv. 5

# Tens of Thousands of feet altitude and still on the ground!



Supercharged engines are playing a tremendous part in our high-altitude fighting and bombing. The superchargers must be absolutely right for the job—which means careful testing.

A leading manufacturer was faced with the problem of duplicating altitude conditions at the exhaust of the gas turbines used for driving their superchargers. Specifically, the problem involved the use of vacuum apparatus to handle large volumes of hot exhaust gases at suction pressures corresponding to tens of thousands of feet in the air.

After studying all phases of the problem with Ingersoll-Rand, the manufacturer installed several large steam jet ejectors—largely because of the reliability, simplicity, compactness, and ease of operation secured with such apparatus.

Repeat orders indicate the success of this solution of an important war production problem.

May we cooperate with you in the application of vacuum apparatus?



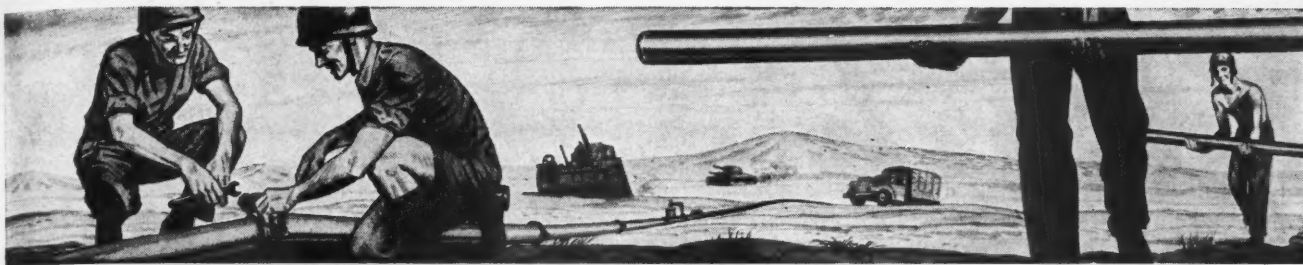
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11 BROADWAY, NEW YORK, N. Y.



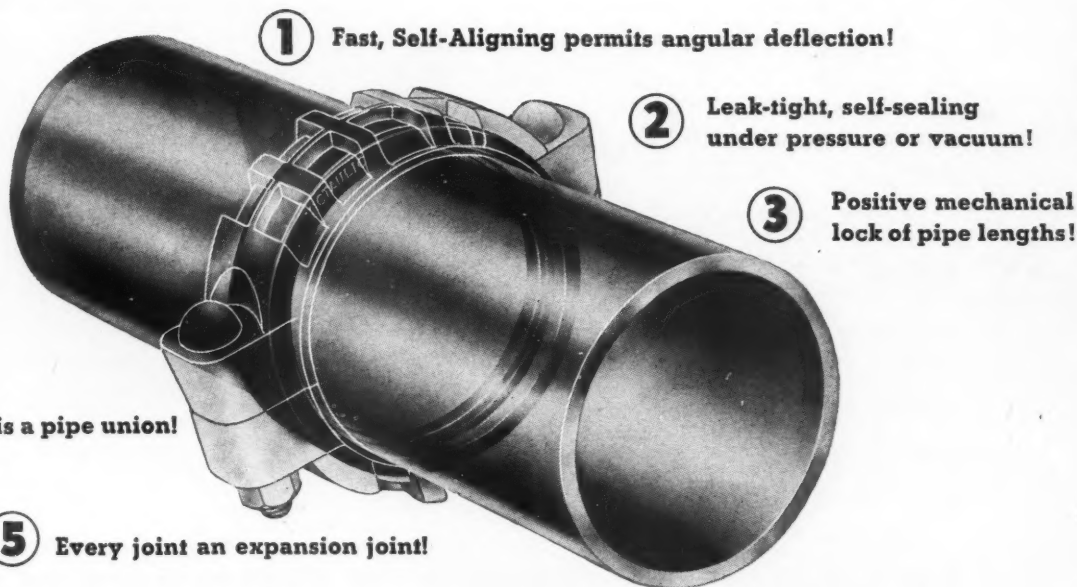
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CENTRIFUGAL PUMPS • CONDENSERS • COMPRESSORS • TURBO BLOWERS • ROCK DRILLS • AIR TOOLS • OIL AND GAS ENGINES



## BLITZ PIPELINES

One of the potent weapons in the Allied blitz campaigns in North Africa and Sicily turned out to be Victaulic coupled portable pipelines that could be laid by unskilled or regular Army personnel at the rate of 10 to 30 miles a day so oil, gasoline, or water could keep pace with swiftly advancing troops. Specially designed pipe, grooved for Self-Aligning Victaulic Couplings, was used. Victaulic is the fastest known way of coupling pipe . . . and Victaulic gives you all these other basic advantages . . .



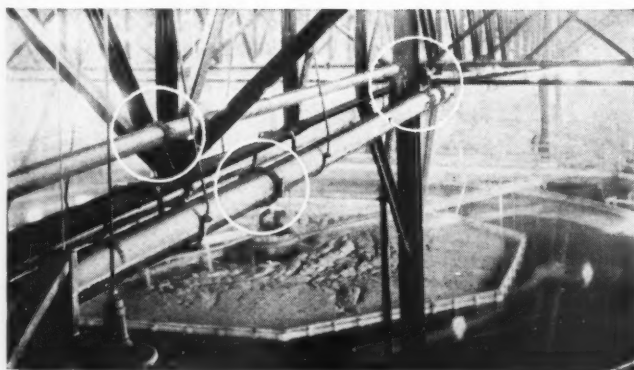
**1** Fast, Self-Aligning permits angular deflection!

**2** Leak-tight, self-sealing under pressure or vacuum!

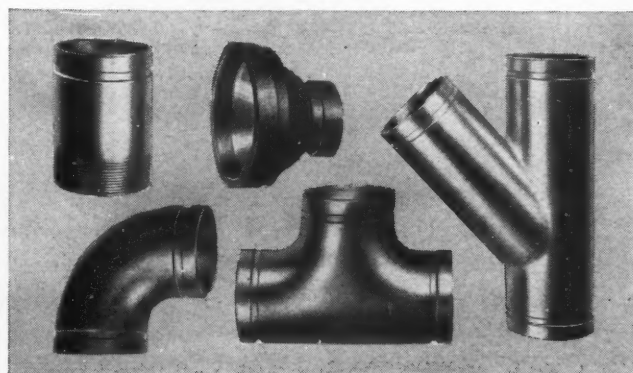
**3** Positive mechanical lock of pipe lengths!

**4** Every joint is a pipe union!

**5** Every joint an expansion joint!



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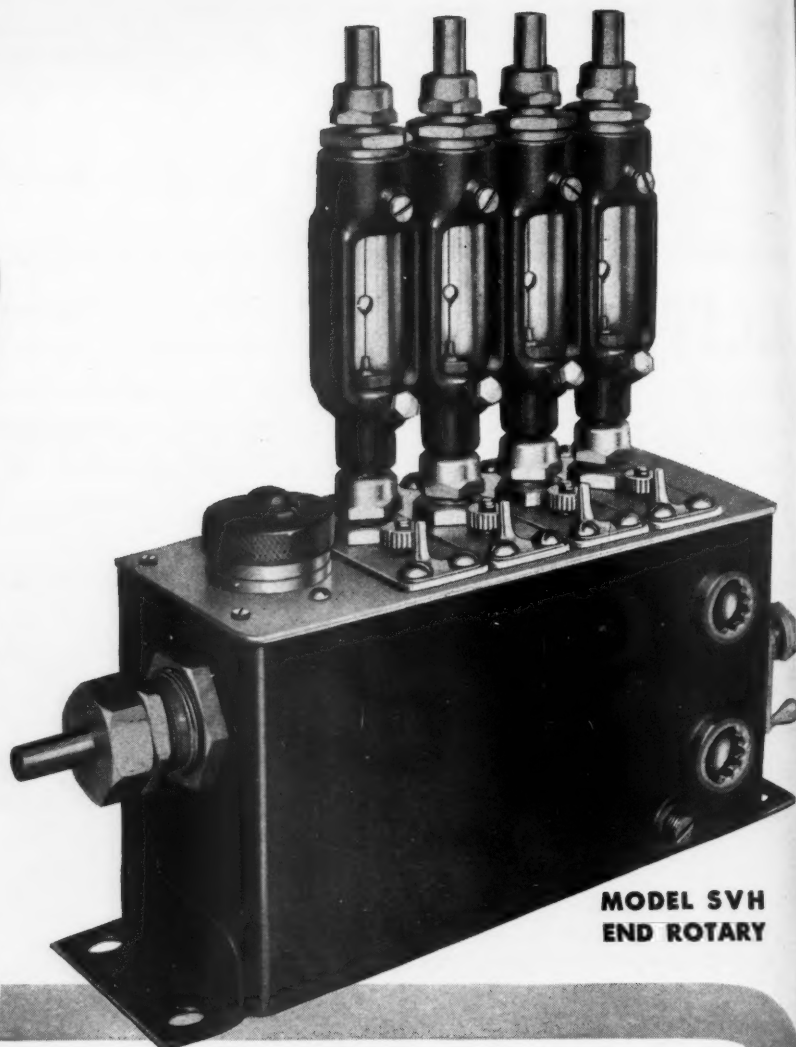
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**FED UNDER PRESSURE  
DROP BY DROP**



**MODEL SVH  
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*the most dependable method of lubrication ever developed*

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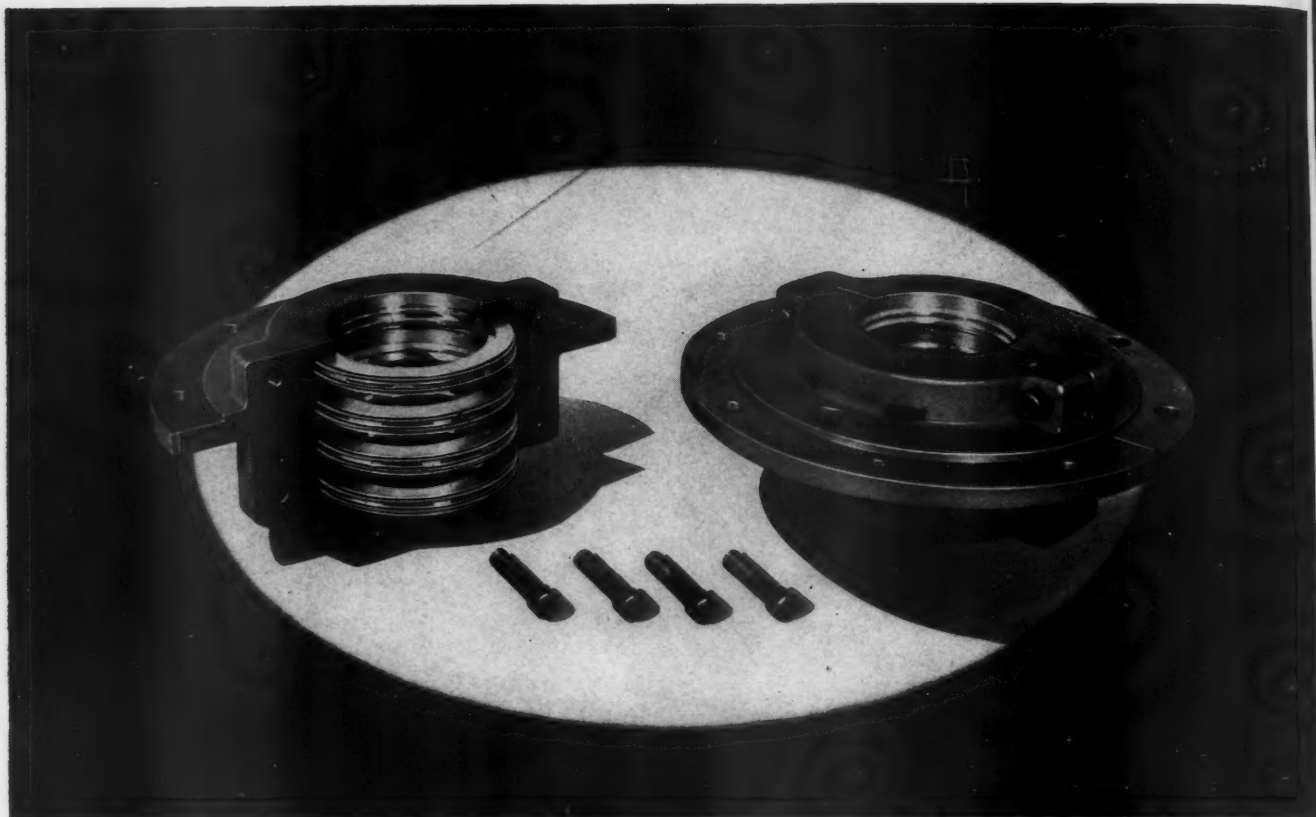
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**GENERAL  ELECTRIC**



## IMPROVED OIL CONTROL PACKINGS FOR ENCLOSED FRAME ENGINES AND COMPRESSORS

**U**nder war's expanded demands for Metallic Packings, COOK has not only multiplied production, but has also developed many new types—packings to meet 750°F. superheated steam—to withstand the corrosive action of various gases—to meet the special requirements of the synthetic ammonia and synthetic rubber industries—packings for the engines of Liberty and Victory Ships and "special" ships by the hundreds.

Among these developments are oil control packings, like the one shown above—packings which meet and satisfy the varied oil control requirements of enclosed crank case type Diesel, gas and steam engines, air and gas compressors, and pumps—packings that keep crank case oil out of the cylinders and prevent oil formations and carbon deposits and resulting stuck piston rings, valve failures, fouled inner coolers and receivers—packings that keep compressed air

or gas free of oil—packings that pay their way many times over in oil and trouble saved.

All of these new developments have proved up in service—demonstrating again and again the effectiveness of COOK design, materials and production.

You too may have a packing problem that calls for something different—something better. If so, our engineers are ready to serve you. And when you call in COOK, you get the benefit of 55 years' experience manufacturing exclusively Metallic Packings for Pistons and Rods.

C. LEE COOK MANUFACTURING CO., Incorporated, Louisville, Kentucky. Branches and Representatives: Baltimore, Boston, Chicago, Cleveland, Houston, Los Angeles, Mobile, Montreal, New Orleans, New York, Portland, Ore., San Francisco, Seattle, Tulsa.



"Sealing Pressures  
Since 1888"

# COOK'S

# METALLIC PACKINGS



# 2 WAYS

## TO CUT DRILLING COSTS

### 1 USE DETACHABLE BITS

Detachable bits drill faster than ordinary steel bits—and even work well in soft or muddy ground. Yet they are safe for use in stopes and raises. There is more time for drilling because steel doesn't have to be carried back and forth on the job. Steel shop costs are reduced—so are nipping charges. A simple forming and gauging operation is all that is necessary to put a detachable bit back into service. No forging or re-tempering is needed.

### 2 KEEP THEM PROPERLY GROUND

For best results, be sure to use grinding wheels that are specifically made to hold their shape and to cut fast, free and cool . . . wheels that give you accurate gauge and form with longer tool life between grinds and lowest cost per grind. Every grinding wheel today is a "Weapon for Production." Use it wisely.

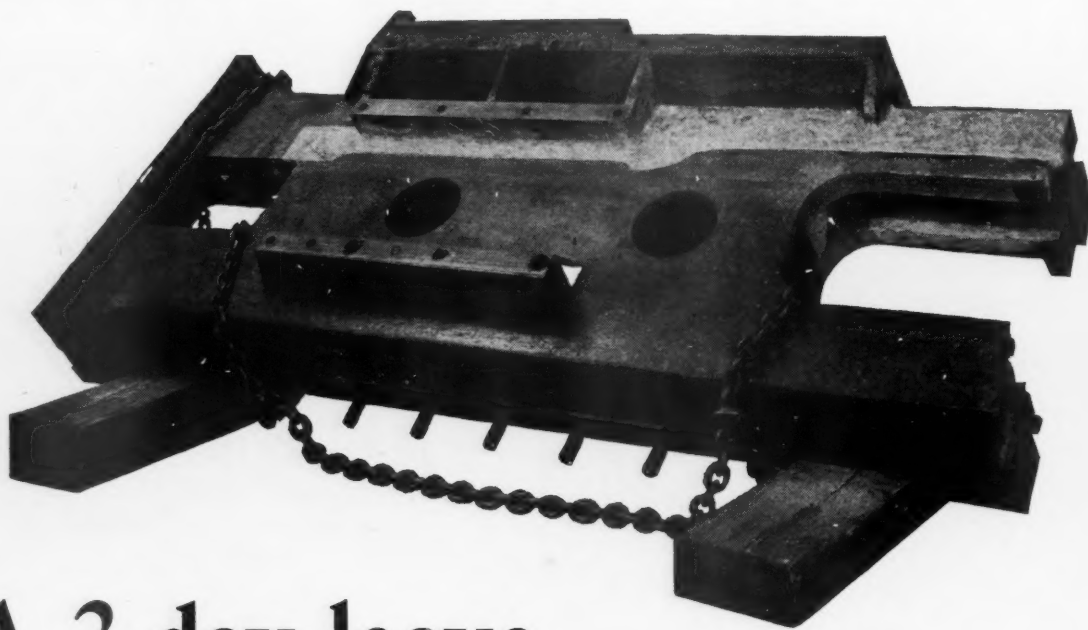
*Every hour this war is shortened will save \$12,000,000. The lives it will save are priceless. Let's get it over with—quickly.*



**THE CARBORUNDUM COMPANY • NIAGARA FALLS, N. Y.**

MANUFACTURERS OF GRINDING WHEELS, COATED ABRASIVES, SUPER REFRACTORIES, HEATING ELEMENTS

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# A 3-day leave instead of 10 months A.W.O.L. *Thanks to Bronze Welding*

Out of action for some ten months might well have been the fate of this cast iron column of a press producing 75 mm. shell cases. For that's about how long it would take to get a replacement these days.

But bronze welding came to the rescue. Although the 8-ft. high, 6-ton heavy casting had cracked for a distance of 7 feet, the fracture was quickly repaired in the shop by the Super Arc Welding Company, Detroit, Mich. 20 man-hours for preparation, 48 man-hours for welding, 400 lbs. of Tobin Bronze\* Welding Rod—and the

\*Reg. U. S. Pat. Off.

column was back on the job. That was nearly a year ago. Today, the repaired press is still giving a good account of itself—instead of making shell cases—pressing out an important motor part for army trucks and armored cars.

For speedy, wartime repair welding, never overlook the advantages of such rods as Tobin Bronze and Anaconda 997 Low Fuming. For complete information, write for the new edition of Anaconda Publication B-13.

4886A

**BUY MORE WAR BONDS FOR VICTORY**

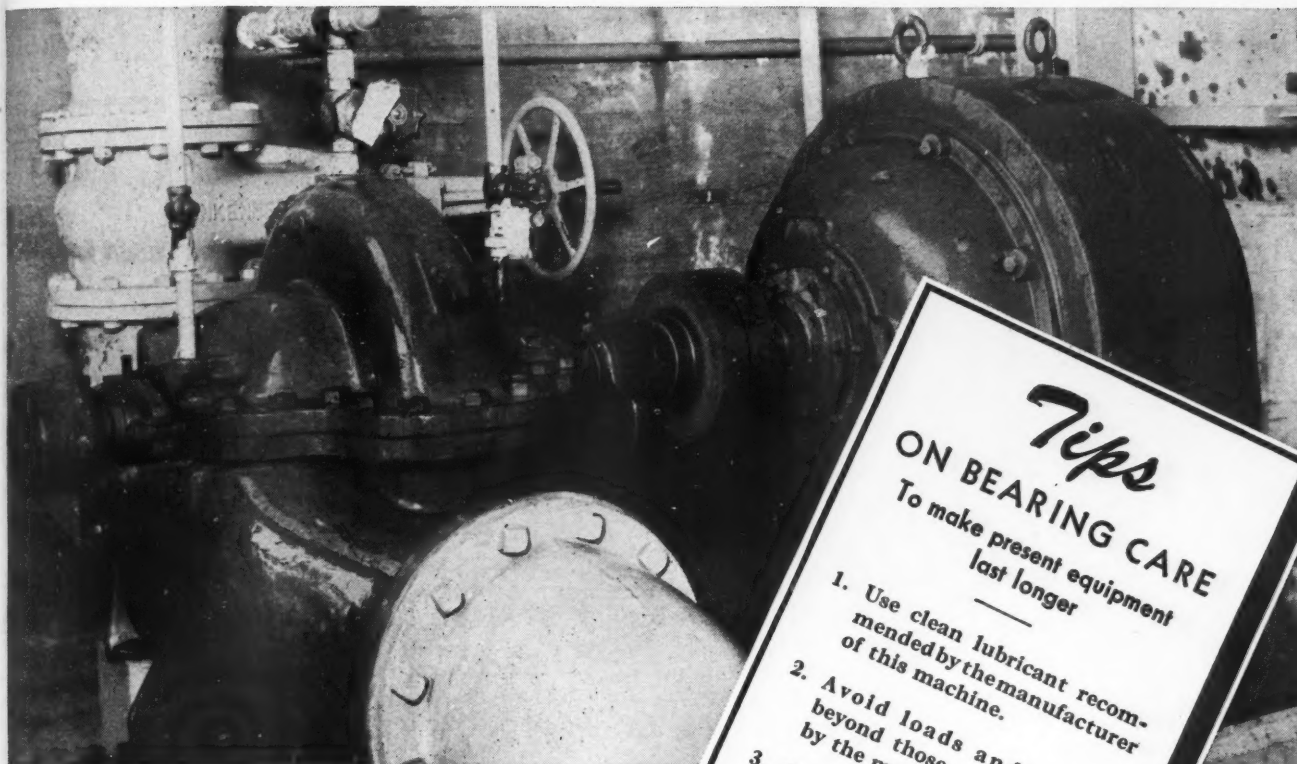


## Anaconda Welding Rods

THE AMERICAN BRASS COMPANY, General Offices: Waterbury 88, Connecticut  
Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario

# 4500 gallons per minute

## ON SKF BEARINGS



● Built by INGERSOLL-RAND CO.

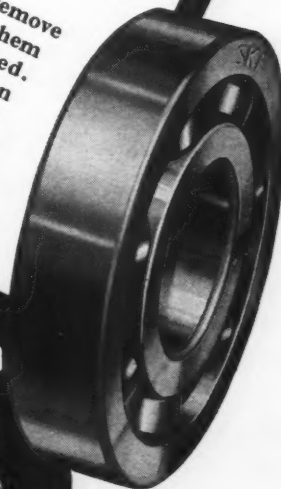
The advantages that enable SKF Bearings to move freely and continuously while this size 12-AFV Cameron Pump transmits 4500 gallons of water per minute at 1150 r.p.m., 78-foot head, didn't just happen. Their lifetime close tolerances are the result of good design. The through-hardened steels of which they're made comes from the proper selection of materials. Their unvarying ability to take combined radial and thrust loads is the product of skilled craftsmen and precision machines. All advantages that enable users of these pumps to increase production for Uncle Sam.

5388

### Tips ON BEARING CARE

To make present equipment last longer

1. Use clean lubricant recommended by the manufacturer of this machine.
2. Avoid loads and speeds beyond those recommended by the manufacturer.
3. Check wiring and insulation frequently. Short circuits or stray currents can damage bearings.
4. If necessary to remove bearings, keep them properly lubricated. Avoid the intrusion of water and dirt. Apply pressure on the inner race only. Don't hammer outer race.



# SKF

BALL AND ROLLER  
BEARINGS

SKF INDUSTRIES, INC., PHILA., PA.







# Check list FOR BIG OUTPUT AND LOW MAINTENANCE



This 32 page, 5½ x 8½" booklet, attractively illustrated and printed in two colors, is packed with practical, experience-tested suggestions on how to maintain maximum excavator production. Ask your Bucyrus-Erie excavator distributor for copies for your organization, or write us direct if you prefer.

Efficient job planning and preventive maintenance essential to continuous peak excavator performance demand constant vigilance. Check your operations against this list to make sure nothing important is being neglected:

- ✓1. Give your operator a chance to be a good one. Plan your job setup to move materials with the fewest motions in the shortest distance.
- ✓2. Analyze your cycle time, study delays and the percentage of your job efficiency at regular intervals.
- ✓3. Weigh monthly production records rather than daily. Steady output chalks up records that count.
- ✓4. Keep your excavator clean and inspect thoroughly at regular intervals. Stop troubles before they start, make repairs promptly.
- ✓5. Watch adjustments daily. Keep them right, always. This speeds output, saves repairs.
- ✓6. Keep lubricants *clean*. Dirt and grit build up into a grinding compound, sabotaging machinery.
- ✓7. Follow lubricating instructions religiously. Correct lubrication is best prescription for long life and trouble-free operation.
- ✓8. Drain engine crankcase while hot, flush out periodically. Keep fuel clean. Use clean soft water in radiator, flush regularly, don't put cold water in a hot engine.
- ✓9. Observe safety rules. Accidents are losses to everyone concerned. Safety first pays dividends.

Each one of these points is discussed in detail — there are over 100 specific suggestions — in a free booklet we hope will be helpful to your organization. It applies to all makes of excavators.



# Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.



## TAMPTITE

**Speeds work - saves time**

A Tamptite cartridge is easily, quickly inserted into the bore hole in the usual manner. No wasted man-hours slitting cartridges. No loose, spilled powder to worry about. Then—



## TAMPTITE

**Packs snugly**

**gives better breakage**

You tamp a Tamptite cartridge in the usual manner. It packs evenly, snugly—leaves little air space—concentrates the charge for good breakage, faster mucking.

**I**NCREASED TONNAGE, together with savings in valuable man-hours, can be gained by using your regular Hercules explosives in the new Tamptite\* cartridges. Tamptite shells are convenient, easy to use. They eliminate the mess and trouble of slitting cartridges. They compress in the bore hole with a compactness that assures good breakage. And, the better breakage, of course, means easier, faster mucking. In fact, Tamptite speeds up your entire mining cycle. On your next order, specify Hercules in Tamptite cartridges.

# HERCULES EXPLOSIVES



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A-99





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*...and built to carry it!*



IRON ORE . . . that happens to be the critical payload in this case. We are proud to be playing our part in this important work.

Born of nothing more than rough sketches and verbal expressions, these bodies represent the ideas of a practical operating man and EASTON'S conception of how to accomplish his job. What EASTON has done for others can also be done for you.

EASTON has been a specialist in tailor-made trailers, dump trucks, mine cars, and electric lift trucks for years. If you're confronted with a materials handling problem, there's a good chance we can help you. Write to: Engineering Counsel, Easton Car & Construction Company, Easton, Pa.

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TRUCK BODIES • TRAILERS  
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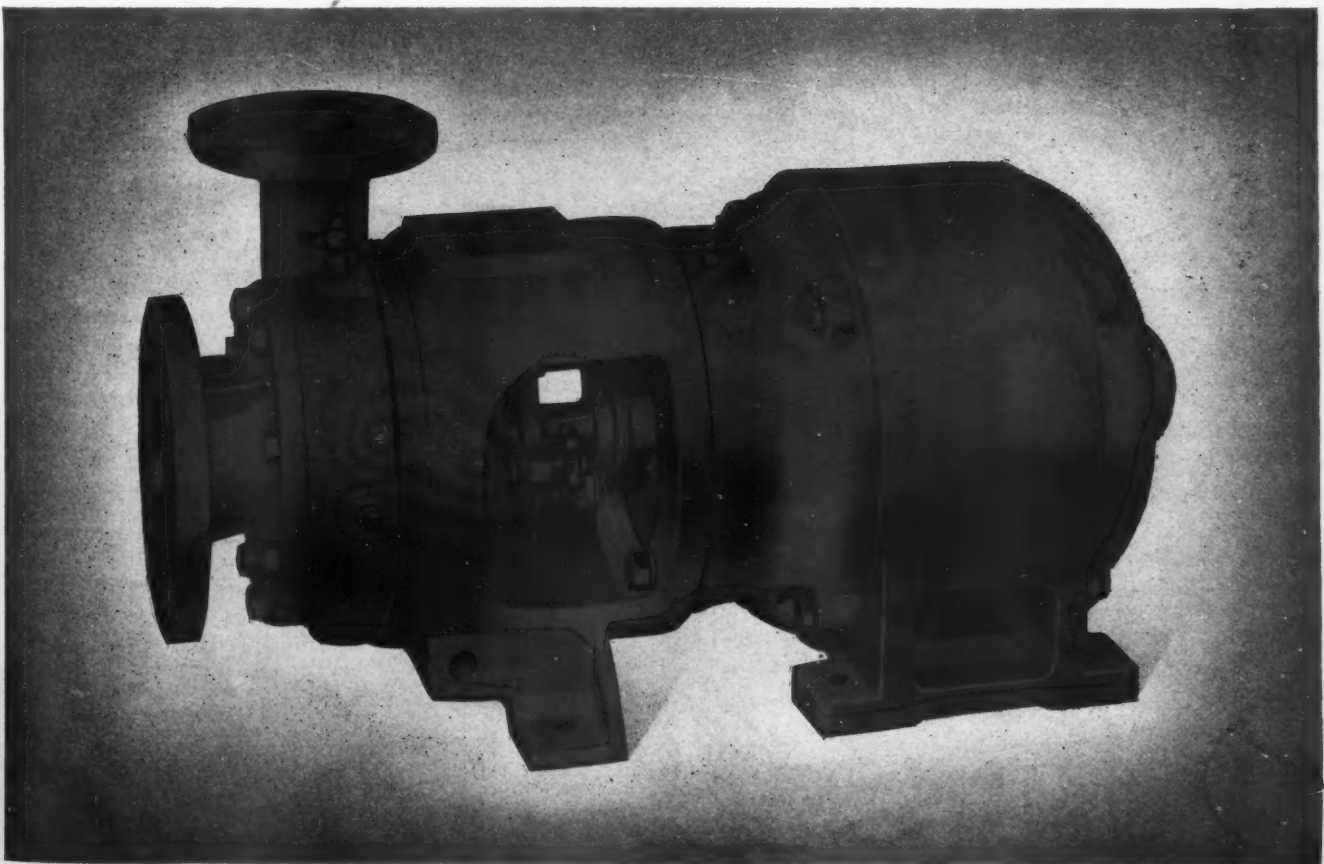


# JACK OF ALL TRADES *and master of them too*

The Motorpump is truly a jack-of-all-trades, and master of them too, because of its compactness, sturdiness, efficiency and adaptability. Wherever liquids are being handled you will find Motorpumps—from refineries to ships and from the tropics to the arctic. • Motorpumps are available in a wide range of sizes and all can be installed easily without costly special foundations. Capacities range up to 1800 gpm and discharge heads up to 500 ft. • Thousands of them in all sorts of services are speeding the transport of liquids—liquids that keep machines on the job; liquids needed in processes; liquid foods; liquids that must be removed to keep mines operating, to speed construction work; etc. Ingersoll-Rand Company, Cameron Pump Division, 11 Broadway, New York, N. Y.

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NORTON MOUNTED  
WHEELS *and* POINTS**

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## ON THE COVER

OUR cover picture shows a DA-35 drifter drill at work on the 3200-foot level of a North American metal mine. The quartz-studded face gives ample evidence of the hardness of the ground. As is usual in highly resistant rock, the central cut consists of a group of closely spaced holes that will be shot out first to create a space toward which surrounding holes can break. A cut of this type is generally called a "burn" cut, but is also known in some mining districts as a "burn out," "Michigan," "Cornish," or "Shatter" cut. It consists of from three to five holes, all parallel, and is designed to shatter or pulverize a small section of rock that can be scraped out if it is not all expelled by the blast. One or more holes are not loaded with powder but are left open to provide a space into which the others can break.

## IN THIS ISSUE

THE speed with which our badly crippled Pacific Fleet was restored to virtually full strength following the Japanese attack at Pearl Harbor is a fitting testimonial to the technical skill of the Navy and furnishes proof that Americans can rise from the floor following a knockdown and fight back savagely. *Our Comeback at Pearl Harbor* makes inspirational reading.

Although little known to the average person, fluorspar is a mineral without which, as our second article points out, it would be difficult to wage war. Each ton of open-hearth steel made consumes 6 pounds of "spar," and seven pounds of it is required to produce 100 pounds of aluminum.

Plastic-bonded plywood has given us a new construction material of great strength. It has important wartime uses that are discussed in our third article.

How power-driven industrial brushes accelerate war production is pointed out in a 2-page article.

## PAUL HOFFMAN

WITH deep regret we record the death, on September 11, of Paul Hoffman, author of *Supercharging Aircraft Engines* in our current May and September issues and of *Sidelights on Our Weights and Measures* published in February, 1940. Born in Alsace-Lorraine and educated in Switzerland, Mr. Hoffman joined the engineering staff of Ingersoll-Rand Company in 1911 and became a specialist in turboblowers. In 1932 he was made chief engineer of the company's Phillipsburg, N. J., factory and served as such until 1940, when a heart attack enforced an absence of several months. Upon his return to duty he became the factory's consulting engineer, in which capacity he made important contributions to engineering developments relating to the company's expanded wartime program. His death came suddenly, following a second heart attack. Only two days before he died Mr. Hoffman called our attention to a typographical error in his September article. The word "entrophy" in line 9, first paragraph, second column, page 7138, should be "enthalpy."

# Compressed Air Magazine

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VOLUME 48

October, 1943

NUMBER 10

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A. M. HOFFMANN, Assistant Editor

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# Our Comeback at Pearl Harbor

*R. G. Skerrett*

**W**HAT Japan achieved when she struck us in the Hawaiian Islands two years ago was both a momentarily staggering shock and an enduring bitter lesson for us. But what we did at Pearl Harbor during that attack and what we have done there since then is heartening proof of our powers of instant recoil and our will to win against staggering odds.

In less than two hours on that fateful morning of December 7, 1941, the enemy, with aircraft only, took a grievous toll of life among the officers and enlisted men of the Pacific Fleet and so injured the battlecraft at Pearl Harbor that the whole Island of Oahu would have fallen easily to the foe if he had but known promptly of the crippled condition of our defenses and mustered his main battle fleet for an assault. Happily, the Japanese were not able to take advantage of the situation and it was possible for us, through dint of resourcefulness, tireless energy, and the skillful use of all the facilities remaining available, to repair the still floating ships quickly and to salvage the sunken ones, for the most part, within an astonishingly short period.

Two years ago, Pearl Harbor was scarcely more than just a name for most of us. Still fewer of our citizenry that had provided funds totaling quite \$100,000,000 for creating a commodious haven and repair base for our Pacific fleet were aware of how we acquired the right to make Pearl Harbor what it has become in a military sense. Tucked away in volumes detailing the voyage of the United States Exploring Expedition of 100 years ago is the pertinent account of how Lieut. Charles Wilkes, U.S. Navy, in command of a squadron assigned him, reached Honolulu in 1840 and how, while there, he was requested



## EVIDENCES OF DAMAGE

The picture just above was taken almost immediately after the attacking Japanese planes had left and shows billows of smoke rising from vessels that were still burning. The upturned hull of the capsized battleship "Oklahoma" appears at the right, and the U.S.S. "Maryland," which was inboard of the "Oklahoma" and consequently protected from aerial torpedoes, is on the left. She was little damaged and was one of the first of the stricken ships to rejoin the fleet. At the top-center is seen one of the great dry docks with a mass of jumbled wreckage. In the foreground are the destroyers "Downes" and "Cassin," which were bombed beyond repair but from which considerable machinery and fittings were salvaged. In the background is the battleship "Pennsylvania," 33,100-ton flagship of the Pacific Fleet, which was injured only slightly. The view at the right-center shows the badly damaged U.S.S. "West Virginia." The apparently uninjured craft alongside is probably the battleship "Tennessee." At the top-left are two barnacle-coated guns from the hopelessly blasted battleship "Arizona" as they appeared after long submergence. Much of the equipment of the "Arizona" has been reclaimed from the depths by divers of whom one is pictured at the bottom-right handing up part of a machine. A pneumatic chipping hammer, typical of the many air-operated tools used in the salvage and repair work, lies on the deck in the left foreground.

by the then king of the Hawaiian Islands to survey the great land-locked lagoon situated about 8 miles west of Honolulu and named Pearl River Har-

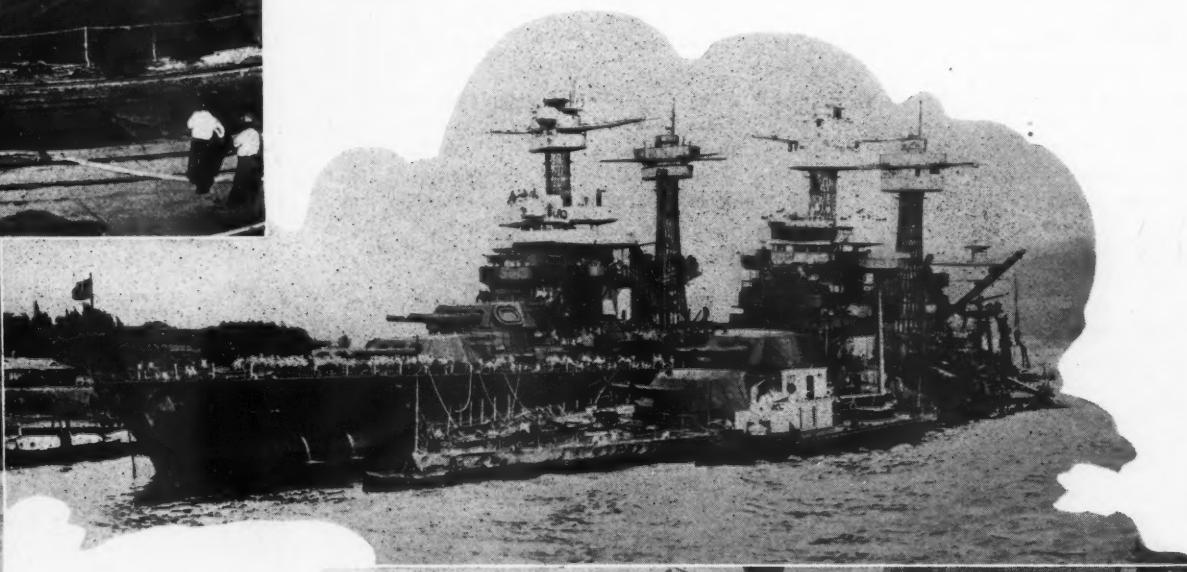
bor because it was the only known area given about the islands in which the pearl oys What ter could be found. Lieutenant Wilkes had Pearl Harbor surveyed, and reportment



tiations with the United States for a treaty of commercial reciprocity, which was ratified in 1875 and became operative the following September. That treaty was to remain in force for seven years and, unless either country expressed a desire to terminate it, for twelve more months. The treaty was a boon to the islands because it offered a ready market for their sugar and stimulated the development of the industry. So much was the Kingdom of Hawaii the gainer that many members of Congress were opposed to its renewal unless the United States would obtain some advantage thereby. The reciprocity convention was concluded near the end of 1884, but not ratified until December 9, 1887. Under the terms of that agreement, the United States Government was granted the exclusive right to enter the harbor of Pearl River and to establish and maintain there a coaling and repair station for the use of her vessels. To that end the United States was empowered to improve the

entrance to the harbor and to do all other things "needful to the purpose aforesaid."

Having obtained the right of control, we did nothing to improve Pearl Harbor until after the Hawaiian Islands were annexed to the United States on August 12, 1898. Three years afterwards Congress appropriated \$150,000 with which to acquire land for a naval station at Pearl Harbor and for harbor and channel defenses. In 1908 the Secretary of the Navy made this significant statement in his report: "The Department regards the immediate development of a base at Pearl Harbor as a matter of the highest importance. Congress at its last session authorized the construction of a dry dock at the naval station at Pearl Harbor, Hawaii, the limit of cost being fixed at \$2,000,000." A year later, he stated: "The naval base at Pearl Harbor, Hawaii, has been started under favorable appropriations and conditions, and it is hoped that the building up of this important station can be rapidly



Japanese were still appears at Alabama" was little At the wreckage, bombed salvaged. p of the er shows ed craft barnacle- appeared been reom-right of the deck in

ed: "The depth of water at its mouth was found to be only 15 feet; but after passing this coral bar, which is 400 feet wide, the depth of water becomes ample for large ships, and the basin is sufficiently extensive to accommodate any number of vessels. If the water upon the bar should be deepened, which I doubt not can be effected, it would afford the best and most capacious harbor in the Pacific." There the matter rested until after 1874, when King Kalakaua ascended the Hawaiian throne and visited the United States.

A retired officer of the Medical Corps of the U.S. Navy not long ago described King Kalakaua as "a merry monarch, addicted to personal pleasures, and given to visions of aggrandizement." Whatever may have been his frailties, he had an eye to the financial betterment of his realm. He revived nego-

